

WHAT IS CLAIMED IS:

1. A chitosan/acidic biopolymers hybrid fibers in which the inner part of the fibers comprises chitosan or salts thereof and the surface of the fibers are covered by
5 a complex of chitosan and a biodegradable acidic biopolymers and which retains the form thereof when the fibers are soaked in DMEM medium (Dulbecco's Modified Eagle's Medium) at room temperature for 2 weeks.

2. A chitosan/acidic biopolymers hybrid fibers of
10 Claim 1 in which the acidic biopolymers are selected from the group consisting of hyarulonic acid, alginic acid, chondroitin sufate, dermatan sulfate, heparin, heparan sulfate, keratan sulfate and polyglutamic acid.

3. A method for preparing the fibers of Claim 1
15 which comprise the steps of:

1) dissolving chitosan in an aqueous acid solution to prepare an aqueous solution of chitosan salt;

2) wet spinning the aqueous solution of chitosan salt using alkaline earth metal salts as coagulants to form
20 fibers;

3) immersing the fibers in a solution of biodegradable acidic biopolymers to react chitosan with acidic biopolymers on the surface of the fibers to form chitosan/acidic biopolymer hybrid fibers;

25 4) optionally stretching the hybrid fibers; and

5) treating the fibers with bases, di- or more-basic inorganic acids or salts thereof, tri- or more-basic organic acids or salts thereof.

4. A method for preparing the fibers of Claim 1
5 which comprise the steps of:

1) dissolving chitosan in aqueous acid solutions to prepare aqueous solutions of chitosan salt;

2) wet spinning the aqueous solution of chitosan salt using bases, di- or more-basic inorganic acids or salts
10 thereof, tri- or more organic basic acids or salts thereof as a coagulant to form fibers;

3) immersing the fibers in a solution of biodegradable acidic biopolymers to react chitosan with the acidic biopolymers on the surface of the fibers to form
15 chitosan/acidic biopolymer hybrid fibers ; and

4) optionally stretching the hybrid fibers.

5. Three dimensional scaffolds for animal cells comprising the fibers of Claim 1.

6. Three dimensional scaffolds of Claim 5 in which
20 the animal cell is chondrocyte.

7. Three dimensional scaffolds of Claim 5 in which the animal cell is fibroblast.

8. Three dimensional scaffolds of Claim 5 in which the animal cells are undifferentiated cells.

25 9. A method for culturing chondrocytes comprising

culturing chondrocytes cells in vitro using the three dimensional scaffolds of Claim 6.

10. A method for culturing chondrocytes of Claim 9 in which a growth factor is added during culturing.

5 11. A method for culturing of Claim 9 or 10 in which the culturing is effected under a low oxygen condition of 1 to 15 % and / or under a pressure of 0.1 to 20 MPa.

10 12. A method for culturing fibroblasts comprising culturing fibroblasts in vitro using the three dimensional scaffolds of Claim 7.

13. A method for culturing fibroblasts of Claim 12 in which a growth factor is added during culturing.

15 14. A method for culturing fibroblasts of Claim 12 or 13 in which culturing is effected with a stretch stimulus of 0.01 to 50 mm/cm being added.

15. A method for culturing animal cells comprising culturing undifferentiated cells in vitro using the three dimensional scaffolds of Claim 8.